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Forssell's Operation for the Cure of Crib-biting.*

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The operation I have the honour to present to you to-day is one which should always be coupled with the name of Prof. Forssell, Professor of Surgery at the Stockholm Veterinary College, who in 1913 first gave an account of his method of operating for the cure of crib-biting. Prior to this time various operative measures had been tried, the aim in all being to throw out of functional activity some of the muscles which the horse uses for crib-biting.

Gerlach performed myotomy of the Omo-hyoid muscles. Hertwig did tenotomy of the tendons of the Sterno-cephalic muscles. Hell and Schwendiman divided these muscles. Dieckerhoff tried two operations: (1) neurectomy of the ventral branch of the 11th Cranial nerve supplying the Sterno-cephalic muscle of each side; (2) myotomy of the Sterno-thyro-hyoideus muscles. The results of these various methods were, as a rule, negative or early recurrence of the vice. In 1919 when in Denmark I had an opportunity of seeing at the cavalry barracks in Randers, through the kindness of Mr. N. M. Mose, veterinary surgeon, a horse he had operated upon and it was from him that I first learnt of the operation and its possibilities, though I was not fortunate enough to witness such an operation. I saw further cases which had been operated upon at the same barracks in 1925. Towards the end of that year I gave particulars of the operation to Major Townsend, R.A.V.C., who has performed it with good results on army horses at Aldershot.

It was not until the autumn of last year that I had an opportunity of doing the operation myself, and my experience is limited to three cases, but I am convinced from these that the operation is a useful one.

Indications for Operation. The operation is indicated in all cases where horses are in poor condition, or where there is difficulty in keeping them in condition from the almost continuous dissipation of energy involved in crib-biting and wind-sucking.

General Purpose of Operation. The general idea is to remove a large part of the muscles the horse uses for crib-biting, these being the Sterno-cephalic, Omo-hyoid, and Sterno-thyroid muscles of both sides. In removing the part of the Sterno-cephalic the ventral branch of the 11th Cranial nerve is severed, so that the remaining caudal part of the muscle permanently atrophies.

As time is limited, I will briefly refresh your memories of the anatomy of the ventral aspect of the neck by showing you a series of lantern slides, and those who are interested in the subject will still further supplement what I have to say by reference to any of the standard text books on anatomy, or better still by a dissection of the cadaver.

* Presented to the Scottish Metropolitan Division at Edinburgh on 15th June, 1927.

Preparation of Horse for Operation.

General. Care should be taken not to have the alimentary canal overloaded, by withholding bulky food for two or three days before operation, but I do not believe in starvation, and as the operation is a long one under a general anæsthetic, I believe the risks of delayed chloroform poisoning are diminished by giving the horse a small bran mash with eight to ten ounces of glucose, about three hours before operation. Glucose and sodium bicarbonate can be given to advantage for two or three days before operation.

Local. One or two days before operation have the skin shaved from the middle of the mandibular space to the lower third of the neck extending laterally beyond the jugular furrow. The skin should be well cleansed with soap and water after shaving. Some hours before operation the dry skin may be painted with tincture of iodine.

Anæsthesia. Following chloral hydrate narcosis (one or two ounces, according to size of animal, given one hour before casting), general anæsthesia is maintained with chloroform, using a Cox's muzzle. I usually give the chloral in water with treacle by mouth, but in awkward horses I employ the rectal method.

Position for Operation. Cast the animal by any convenient method and when anæsthetised have it placed on its back with the head extended, but the head should not be too strongly extended as there is a risk of stretching the recurrent laryngeal nerves after the neck muscles are divided, which may necessitate a subsequent roaring operation.

Steps of Operation.

General Remarks. Every endeavour should be made to carry out the operation with scrupulous surgical cleanliness; it is criminal to do otherwise. Surgical cleanliness is still in its infancy in veterinary practice, and the problem of its application more generally in veterinary surgery, especially of the smaller animals, is one which will need to be solved throughout all the large centres of population of the country and will be an important factor in saving us, as a profession, from the inroads of sentimental or ill-advised philanthropists who are supporting free cliniques with no qualified professional staff in charge.

(1) An assistant paints over the shaved area of the skin with tincture of iodine.

(2) Sterile holland cloths are fixed to the skin by towel clips so as to leave a field of operation about three inches wide in the middle line of the neck and in length long enough to permit the limits of the skin incision to be made (see below). The front of the chest and legs are also best shut off with cloths.

(3) Paint the exposed area of the skin again with tincture of iodine and score the skin with five or six transverse scratches, which assist one in obtaining accurate apposition of the skin edges when finally closing the wound.

(4) Skin incision. Make an incision in the middle line from the body of the hyoid bone, which can be palpated

in the mandibular space, to the middle of the neck. The incision should be deep enough to cut through the skin and fascia covering the Sterno-hyoid muscles.

(5) Clip another square of holland cloth to each side of the incision by means of three or four Lane's tissue forceps, so that no skin is now visible. These forceps serve as a series of wound retractors during the operation.

(6) Resection of the Sterno-cephalic muscle. Retract the skin and fascia on one side of the wound so that the deep layer of superficial fascia which passes upwards and outwards deep to the Sterno-cephalic muscle at the posterior part of the wound may be longitudinally incised to allow a finger to be passed round the belly of the muscle and thus free it from its fascial sheath. I usually pass a Kocher's blunt dissector transversely below the muscle and then sever the muscle by cutting down on to it.

The oral extremity of the severed muscle is grasped with vulsellum forceps, which can then be used to draw the anterior part of the muscle forwards while the operator isolates it from its sheath of fascia by dissection, using either Mayo's dissecting scissors or a scalpel, taking care to keep close to the muscular belly and tendon so as not to damage the jugular vein. In doing this the nerve supply to the muscle from the 11th Cranial nerve is cut about 1½ inches posterior to the cranial end of the fleshy belly. Strong traction upwards and forwards allows the tendon to be cut with scissors at the point where it is disappearing under the external maxillary vein and parotid gland.

(7) Resection of the other Sterno-cephalic muscle as described in (6).

(8) Section of the Omo-hyoid muscle. This muscle requires to be divided along a line which follows the direction of the jugular furrow and, as the carotid artery and the thyroid gland with its very vascular supply lie below the muscle, care must be taken not to go too deeply, especially if a scalpel is used to cut from the superficial to the deep surface. The muscle is not more than a quarter of an inch in thickness. I prefer to insert a finger forwards in the loose connective tissue dorsal to the muscle, beginning in the angle where the Omo-hyoid first meets the Sterno-hyoid muscle, the finger really following the belly of the Sterno-thyroid. The muscle can then be cut from within outwards.

(9) Section of the other Omo-hyoid muscle as described in (8).

(10) Section of both Sterno-thyro-hyoid muscles. At the posterior end of the operation wound these combined muscles are easily raised from the trachea and divided by transverse section.

(11) Grasp the oral extremity of the cut Sterno-thyro-hyoid muscles with vulsellum forceps and apply traction upwards and forwards, using scissors to cut the loose connective tissue, which loosely binds the muscular mass to the ventral aspect of the trachea and larynx. As the mass is drawn forwards the Sterno-thyroid muscles are seen going to their attachment to the thyroid cartilage; these are cut with scissors. The most delicate part of the operation occurs at this stage, for, as the combined muscular mass, now consisting of the Sterno-hyoid, Omo-hyoid and the freed Sterno-thyroid muscles enters the mandibular space to be finally attached to the body of the hyoid bone, the lateral edges are overlapped by the corresponding external maxillary vein, necessitating special care in the dissection between the vein and the muscle on each side.

(12) Section of the common insertion of the Sterno-hyoid and Omo-hyoid muscles posterior to the body of the hyoid bone is the final step in the muscular resection.

There is now exposed in the operation wound the ventral aspect of the trachea and larynx with a gutter-like depression on each side in which the thyroid gland stands out prominently, and lateral to this depression on each side the distended external maxillary vein continuous with the jugular vein. Throughout the operation it should be one's aim to leave as much fascia as possible covering the veins.

Control of Hæmorrhage. This is the part of the operation which consumes most time. A plentiful supply of artery forceps should be at hand to control hæmorrhage, for in removing so much muscular tissue numerous muscular branches of both arteries and veins are divided, the hæmorrhage from which must be controlled as the operation proceeds to permit of safe progress. All bleeding points to which artery forceps have been applied during the operation I tie off with iodised cat-gut prepared after the manner of Claudius, but there is always a considerable amount of capillary oozing during the operation which cannot be controlled in this way. Capillary oozing requires constant swabbing to keep the field of operation clear. The more time spent in obtaining hæmostasis before proceeding to close the wound the less risk there is of infection interfering with quick healing.

Closure of Skin Incision. The suture material I prefer for this purpose is silkworm gut, using interrupted sutures throughout. In order to prevent inversion of the lips of the wound, five or six combined tension and co-aptation sutures are inserted at regular intervals along the wound. Using a full curved bayonet-pointed needle, it is entered about one inch from the skin edge and goes through the whole thickness of the skin and underlying attached fascia on both sides of the wound, emerging on the other side at a similar distance from the edge of the wound. Returning it takes up merely the extreme edge of skin on each side. Finally, the suture is tightened up, the knot lying well to one side of the skin wound. Between these sutures sufficient simple interrupted co-aptation sutures are placed to close the wound completely, with the exception of a small opening at each end to allow a piece of rubber-dam to be inserted to act as a drain, for no matter how efficient the hæmostasis has been there is certain to be oozing into the large dead space left by the removal of so much muscular tissue. Each drain is kept in position by a transfixing skin suture. The reason for putting a drain in both ends of the wound is that with the normal flexion of the head when the horse is on its feet there are two dependent areas requiring drainage.

Protection of the Wound. After expressing any clot in the wound cavity, paint over the suture line with tincture of iodine. Cover the wound with sterile Gamgee, or gauze and wool, and keep the dressing in place by a many-tailed bandage round the neck. This may require adjustment when the horse gets to its feet. Further pressure may be applied by means of a broad domette or flannel bandage round the neck to obliterate as much dead space as possible and so limit capillary oozing.

After Treatment.

General. Feed the animal liberally, giving glucose in mashes until the effects of the chloroform and the dangers of surgical shock are over—usually three or four days.

Local. Take off the first dressing in 36 to 48 hours and apply another sterile dressing, as the first is usually saturated with serum and blood. The suture line may be swabbed with tincture of iodine and as great care should be taken to prevent infection of the wound as is taken during the actual operation.

The rubber-dam drains should be removed two days later and sutures about the tenth day.

Complications.

(1) Damage to the Recurrent Laryngeal Nerves. This is most liable to occur when the Sterno-thyro-hyoid muscles are cut across, but is a very unlikely complication if the head is kept at an angle of 40° with the horizontal.

(2) Excessive Hæmorrhage during the Operation. If anæsthesia is inefficient during the operation, great difficulty in carrying out the operation will be experienced from excessive hæmorrhage, and there is nothing more likely to lead to the next complication than excessive blood clot in a wound.

(3) Septic Infection of the Wound. This arises from inefficient attention to surgical cleanliness during the operation and subsequent dressing, and nothing favours the growth of organisms better than a mass of blood clot in the dead space of the wound. If there is excessive blood clot in the wound at the first dressing, it may be advisable to press it out at the extremities where drains are placed, or one may feel justified in removing an end-suture to gain this end, but, in all cases, aim at absolute asepsis in handling the wound, if you are satisfied interference is necessary.

Such a complication means that healing of the wound will be correspondingly longer and a greater amount of connective tissue will form, which may come to act as a modified tendon, leading to some of the cut muscles beginning to function again with consequent recurrence of the vice. Mr. Mose told me that he had re-operated with good results on such a case and removed a fibrous mass from below the trachea in the region where the muscles had been previously resected.

Results.

In a straightforward case, where no complications arise, a horse can return to work with the wound firmly healed in three weeks.

At first there is a marked alteration in the outline of the ventral aspect of the neck, there being a definite prominence at the caudal part of the operation wound due to the severed Sterno-cephalic muscles. This gradually becomes less noticeable as the remains of these muscles atrophy, so that unless one is on the look-out for evidence of an operation, it may easily be missed.

That the operation does not interfere with the usefulness of an animal is substantiated by the subsequent history of the three cases I have already done. [Subsequent history related to meeting by Major Pryer, R.A.V.C. —See report of Proceedings to be published next week. —Ed.]

The first horse I operated upon is present to-day for inspection, and though operated upon last September, has shown no recurrence of its old vice of crib-biting.

In conclusion, I would like to express my indebtedness to Lieut.-Col. Steel, O.B.E., R.A.V.C., and Major Pryer, D.S.O., R.A.V.C., for the opportunity provided to test this operation for myself. To Mr. G. B. Brook, M.R.C.V.S., my assistant, my best thanks are due for all the photographic work shown this afternoon either on the screen or in the form of prints.

What is a Sandcrack ?

An Interesting Action at Stirling.

Marshall v. Stewart.

This was an action at the instance of Henry Brown Marshall, Rachan, Broughton, Peeblesshire, against James Stewart, Cashley, Buchlyvie. Mr Stewart sold to Mr. Marshall a pedigree filly (at the Lanark sales, in October last) which was warranted sound. The pursuer alleged that the filly did not comply with the warranty on the ground that it suffered from a radical defect in the constitution in the shape of a sandcrack. Mr. Stewart refused to accept the return of the filly, and the pursuer sold it and sued him for the difference between the price paid and the price realised. Mr. Stewart defended the action on the ground that the filly did not suffer from a radical defect in the constitution, and that the split in the hoof was not a sandcrack, but was caused by exercising the filly with too heavy shoes.

The case came before Sheriff Dean Leslie, and after hearing expert evidence on both sides the Sheriff has now issued his interlocutor. He holds that the filly did not suffer from a radical defect in the constitution and assoilzies the defender, Mr. Stewart, with expenses. The following is the interlocutor :—

Stirling, 3rd June, 1927.—The Sheriff-Substitute having considered the cause Finds in Fact (1) that on 6th October, 1926, the defender sold to the pursuer at Lanark Auction Mart a two-year-old filly, warranted sound, for £66 ; (2) that on said date the filly was sound ; (3) that the pursuer has failed to prove that at the date of the sale the said filly was suffering from a radical defect in constitution which might not be visible on an ordinary examination ; (4) that the pursuer rejected the said filly, and (5) that on 8th November, 1926, the said filly was sold at Lanark Auction Mart without warranty for £43. Finds in law that the pursuer was not entitled to reject the said filly. Therefore assoilzies the defender. Finds the pursuer liable in expenses to the defender in the expenses of process. Allows on account thereof to be given in ; and certifies Andrew Sillars, M.R.C.V.S., and Professor William Robb, F.R.C.V.S., as expert witnesses. (signed), J. Dean Leslie.

The Sheriff's Note.

This is an action at the instance of the buyer of a filly against the seller for the difference between purchase price and the price obtained by the sale of the filly subsequent to rejection by the buyer. On 6th October, 1926, the defender exposed for sale at Lanark Auction Mart a two-year-old

filly. It was warranted sound. Number 4 of the Special Conditions of the Sale made by the Auctioneers was: "Disclosures must be made by the sellers of any vice, radical defect in constitution or wind that may not be visible on an ordinary examination, and the sale of any horse subject to any such vice or defect shall be void unless due intimation has been given." Number 7 of the Conditions was in these terms: "Except as to the disclosures required under Article 4 to be made, as to which objection may be taken at any time on discovery, no objection as to warranty or otherwise can be entertained except the same be intimated to the auctioneers not later than 8 p.m. on Saturday, 9th October, for those (horses) sold on 6th October."

The filly was bought by the pursuer for £66, having gained second prize in a show of fillies. After the purchase the filly was examined by James Brown, Veterinary Surgeon, Perth, on behalf of the pursuer, and he informed the pursuer's foreman, Irvine, that she was sound. The filly was taken to the pursuer's farm and put into a field with two horses also bought that day. At night on October 10th the foreman found that she was lame on the off hind foot. He took her to the stable and removed the shoe from the lame foot. It was found that there was a fissure on the surface of the outside quarter of the off hind hoof. Intimation of unsoundness and rejection was made verbally on behalf of the pursuer to the auctioneers on 11th October. As this intimation was not timeous in terms of Art. 7 of the Conditions of Sale, the pursuer had to rely upon Art. 4 of these Conditions to justify his rejection of the filly.

The questions to which the proof was mainly directed were, first, whether the fissure in the hoof was a "sand-crack," and second, whether a sanderack is "a radical defect in constitution." All the expert witnesses examined had a difficulty in defining "sanderack." Not one could give a scientific definition. For instance, Professor McCall for a time declined to attempt it. Finally he accepted the so-called definition given by a writer, Caulton Reeks, in these terms: "A solution of continuity of the horn of the foot, occurring usually in the well-bred, and following in the direction of the horn fibres." Every fissure in the direction of the horn fibres or any rent caused by a shoe nail in that direction is such a solution of continuity. Accordingly, as there was certainly a fissure here, however caused, the filly must have had "sanderack," in Caulton Reeks' and Professor McCall's view.

For the defence, Professor Robb came nearer a definition. He at any rate maintained that for a sanderack the band at the coronet of the hoof which secretes the horn must be involved. Now there is not the slightest evidence that the coronary band was affected. The necessary treatment for a sanderack is cauterising and blistering. The fissure here is disappearing without any treatment, as the hoof has grown down. The fissure was therefore not sanderack.

On the second question, Professor McCall, for the pursuer under cross-examination, adopted the language he had used as a witness in a previous case: "I should define radical defect as something deep-seated and permanent." No witness said that "sanderack" is deep-seated. It is difficult and takes time to cure, and may recur, but was not spoken of as permanent. In my opinion, therefore, it does *not* fall under the category of a "radical defect in the constitution" referred to in Art. 4 of the Conditions of Sale. On the main points in controversy the defender is thus entitled to succeed.

When the pursuer discovered a fissure on the hoof, he called in the veterinary surgeons, Mr. Johnstone and Professor McCall. They both said that the filly was suffering from a sanderack. The former was of opinion that the crack had been in existence for two or three months, and the latter gave the period as "long before the date of the sale," probably six months. Then attention had apparently not been directed to the exact terms of Art 4. At any rate, if the crack had been in existence for the period stated, then it could not be a defect which was "not visible by ordinary examination," much less on a special examination such as that made by the pursuer's veterinary surgeon, Mr. Brown, immediately after the sale. Even therefore if the fissure was a sanderack and a radical defect in the constitution, the pursuer relies on his own witnesses. Art. 4 of the conditions did not justify his rejection of the filly.

I have mentioned that the filly gained a prize on the day of the sale. For the purpose of the show, the filly had been fitted with what has been called "fashionable shoes." These shoes are made thin on the inside and thick on the outside of the hind hooves in order to bring the hocks close in action. The use of these shoes has a tendency to split the hoof from below upwards. Now the practice of men accustomed to show horses is to remove such shoes as soon as their purpose of improving the appearance of the animal before the show judge has been served. The unnatural strain on the hoof is thus relaxed.

The simple explanation of the case is that the pursuer and his foreman seem to have been ignorant of the effect of "fashionable shoes." Instead of removing the shoes at once after the show, they allowed the filly to run with the show shoes on in a field with other horses, with the result that any slight split, which may have been in existence at the time of the sale, and which did not interfere with the soundness of the animal, was increased. Dirt then got into the crack and poisoned the soft part of the hoof so as to render the filly lame. As soon as the hoof was cleaned by poulticing the filly became sound again without the coronary band being affected. The part of the hoof which was split is gradually wearing off as it is pushed downwards by growth of horn from above. For the pursuer's mistake in the management of the filly, the defender is not to blame. I have, therefore, assoilzied the defender.

The Quarantine Stations Scheme.

"The renewed outbreaks of foot-and-mouth disease have increased the demand for the establishment of quarantine stations in this country for animals bought for export," says the Agricultural correspondent of *The Times*. "It is understood that good progress has been made by the Ministry of Agriculture and the Royal Agricultural Society with the development of the scheme, but if at any time there was doubt about the wisdom of pushing on speedily with the enterprise, the recurrence of outbreaks after a long interval of freedom will have dispelled it."

Provisions for a Pure Milk Supply.

DISCUSSION ON DR. J. H. PATTERSON'S PAPER AT WEST OF SCOTLAND DIVISION MEETING.

(*Continued from page 665*).

Professor W. ROBB: As the Chairman has said, I fell into the breach, as the real opener of this discussion should have been our friend, Mr. Douglas, from Kilmarnock, who is a specialist on the subject, and probably would be more at home with it. To me the doctor's address represents the ideal of a public health official naturally striving to get the best out of his duties that he can and, I think, to be fair to him without inflicting any more injury than is necessary on the farmer. I think we can judge that from some of the remarks and from some of the written statements that he has read to us. A public official, even when carrying out his duty, can accomplish this in two ways: with harshness, or in a milder way, without very much friction. The production of a purer milk is a matter of £ s. d., and whether it would pay the farmer in the end is for the farmer to decide. He has to produce it up to a certain standard, but if he wishes to go higher, then it lies for him to put his byre and cattle in order. In the early part of the doctor's remarks to-day, he went into the question of adulteration and deficiency which, of course, does not interest us as veterinary surgeons, because it really lies with the sanitary officer. Something may have been abstracted from the milk, or water may have been added, and I do not know that we are in any danger from that, but we may not get much nourishment. Our part as veterinary surgeons comes in when we deal with something pathogenic to man present in milk; these bacteria being derived from the cow. While I probably have a sympathetic feeling towards the man having a cow with one quarter affected with mastitis, the difficulty would seem to be in telling how long these apparently sound quarters remain non-pathogenic. The man argues: "Why cannot I use the other three?" I believe most of us would reply at once: "You could use the other three if one could guarantee that they will still remain free from streptococci." To-day it has been shewn that, to some extent, these organisms in mastitis are pathogenic to man. I have an opinion that all streptococci are not pathogenic to man, otherwise there would be far more outbreaks of sore throats amongst the public, for many cases occur where there is one quarter affected, and the other quarters are still being used. But then, we know that all cases of mastitis are not of the same virulence. Therefore, I have no doubt that while some streptococci may attack the human being, others are non-pathogenic to man. The first thing that I would like, undoubtedly, is to get the surroundings correct, which means adequate light and ventilation, and an impervious floor, but that is going to be an expensive matter for someone. The proprietor has no spare money, and the farmer usually has less, but sometimes he has more than his landlord. The drastic operations that would need to take place to bring all standings up to the modern standard, if rigidly enforced, would cause many byres to be shut up from want of capital. I do not know that I am such a great believer in the idea of cubic space, if I can get the air changed frequently. I would be much happier to take my milk from the byre provided with sufficient ventilation to give a frequent change of air without draught, where the floor and the cows were kept in a cleanly condition, also the milker and the milking utensils. No one likes to see a mass of dirt at the bottom of a tumbler. It is bad when you see sand, but it is worse when you see excreta.

Although many people would have difficulty in achieving what they would like, I do not see why the average man could not carry out a greater degree of cleanliness. I have seen people with a smaller byre and probably with less money, make a better job than others with more hygienic byres and more money. It is a fact that we may go into a byre and see a number of cows that are all free from filth, and when we examine the next byre of the same size and class we hardly get a clean one. Of course the milking is carried out in the same fashion and they go in for wet milking, carrying the filth from the bodies of the cows into the pail. These are certain things that the man might control. He may not be able to go in for a tuberculin-tested herd, but reasonable cleanliness is easily within the power of the average individual. I quite agree that the doctor was right in his statement as to what are the responsibilities of the farmer, in reporting suspected udders. We are told there is ignorance or carelessness in the non-reporting of the tuberculous udder. Unfortunately, the tuberculous cow may carry on and fill the pail; therefore the man is quite happy; she is not refusing her food, is apparently well and he is quite satisfied, as nothing can be seen in the milk. There is this little lump of slow growth, not painful, and she does not cause any disturbance, so he just lets the thing go on. Where there is a hard lump that does not resemble the ordinary "weed," I think he is entitled to be asked why he did not report it.

I think there is fear among farmers as to reporting, and it lies with us a good deal, as general practitioners, to make them clearly understand that the public health officials do not wish to prosecute, nor have they the power to shut up the whole herd, if they report a case of local tuberculosis of the udder, and that it will cost them nothing to have a visit of inspection. If it should not be a tuberculous condition there is nothing said, and the matter is closed down.

On the question of getting the tuberculosis-free herd—we all know that that means money, and it is going to be a long time, unless you have a lot of money, before you can get your herd clean.

The doctor said he would be willing to take the private practitioner's chart of the test when the herd was clean. Did he mean that he would certify and grant a tuberculin-tested certificate on the strength of it? Personally, I am not at all sure about the ophthalmic test. I have found it irregular. I think many an animal can be tuberculous and show nothing by it, and give a splendid reaction to the subcutaneous test or to the intradermal test. It is a strange fact that these men who have cattle in big herds are not content with what we would think was a fair test. They give large doses of tuberculin and use frequent applications to the eye within the nine or twelve hours, because they are perfectly well aware of the amount of faking and dosing that goes on.

I think there is something strange about the irregularities of tuberculin testing if all the stories that one hears about it are true. Some hold that this is due to inferior tuberculin, others to its age, as if it has been kept too long it will give reactions in a clean herd. Other people hold that the giving of a richer diet makes a difference to the test. Undoubtedly, I think a change in environment will be followed by unsatisfactory charts. I have known of animals recommended by one veterinary surgeon to another (as the herd was clean and he could recommend the purchase of animals out of that herd) go down when tested in their new home, shortly after arrival. There is something peculiar about tuberculin that I do not know yet. I would like to take the opinion of the meeting on the testing of animals that have been injected with Calmette's vaccine.

What is to be the the position when we test those animals with tuberculin? Are they going to react to the focus that we gave them, or are they going to react to the tuberculin on account of being tuberculous?

Within the last few days I tested 18 heifers. Twelve of them had been done with Calmette's injection a year ago. I got 16 reactors and two of the Calmette's passed. In a clean herd how are you going to carry on with these Calmette heifers? You do not know whether you have got a reactor to the vaccine or a reactor to tuberculosis.

I have enjoyed the doctor's paper and I think he has made out quite a good case for the continuation of inspection.

Mr. J. G. MCGREGOR: I wish to offer my thanks to Dr. Patterson for the pleasure he has given in reading his

paper on "Provisions for a Pure Milk Supply" this afternoon. I was most interested to learn the figures he has quoted relative to dairy herd inspection in Lanarkshire during the year 1926, the clinical examination of the 34,632 dairy cows in the County of Lanark revealing the existence of 66 cases of tuberculosis of the udder—in other words, one tuberculous udder was discovered for every 524 cows examined. I would very much like to know if Dr. Patterson could furnish a table showing the incidence of tuberculosis of the udder as revealed by clinical examination of dairy cows from 1900 when this work was begun. Speaking from memory of the years immediately following the end of the war, the number of cows discovered with tuberculous udders during dairy herd inspection was approximately one in a thousand. I wonder if Dr. Patterson can offer any explanation as to why there should be such an increase in the number of cases of tuberculosis of the udder. Are the farmers, as a result of 25 years' propaganda, recognising the condition and reporting it? Or, is it the thought of compensation under the Tuberculosis Order which is causing them to report now, as suspected tuberculosis of the udder, what in previous years was always in their opinion a "weed"? I might add that for 1926 in Stirlingshire the comparative figures were 9,150 cows examined, and thirteen cases of tuberculosis of the udder confirmed, or one case of tuberculosis of the udder in every 700 dairy cows examined.

With reference to the new Dairy Byelaws under the Milk and Dairies Act, 1914, one was glad to hear Dr. Patterson explain his attitude towards the vexed question of air space in dairy byres. Thanks to the research carried out in America, the personal factor is now known to be of more importance in the production of purer milk than lofty and elaborate byres. Milk of Grade A standard is being produced in many byres that will not pass the new Byelaws, and it is hard to penalise those who are unable to face the costs of reconstruction when the milk which is being produced will not be improved by the capital expended. An appeal to the cow is now recognised when genuine milk falls below the presumptive standard in analysis, and for some years at least, a similar appeal to the cleanliness of the milk might be allowed where owners are financially unable to alter their byres to make them comply with the new regulations. The standard of cleanliness of Grade A milk might be taken as the criterion, and failure of the milk produced in the byre to pass the prescribed tests for cleanliness would entail reconstruction of the byre.

With reference to the Milk (Special Designations) Order, there is a point to which I would like to draw attention. One of the conditions subject to which the licence for selling milk as grade A may be granted is, "no animal which, to the knowledge of the owner of the herd, has at any time been tested with tuberculin and has reacted to the test, shall form part of, or, be added to the herd." At present in Stirlingshire several of the grade A milk producers would like to obtain licences for the production of grade A (tuberculin tested) milk, but the condition which I have quoted stops them, as they cannot take the risk of testing their herd and being compelled to put out possibly more than half of their dairy cows. When one finds a herd in which all the heifer calves are reared year after year, and the older animals sold out, a herd in which the only animal introduced at regular intervals is a tuberculin tested bull, then one may have no hesitation in advising the owner to subject the whole herd to the tuberculin test, and I have known a number of such herds to be tested and found tubercle-free. I think the conditions governing the production of grade A milk should be modified to enable producers to test their cows without being compelled to turn out any reactors to the test.

Dr. Patterson has expressed his opinion on pasteurisation of milk; I would like to quote an instance that was brought to my notice recently. Grade A milk with a bacterial content of 4,000 organisms per cc. was found after pasteurisation to have 50,000 organisms per cc.

Mr. Robb has mentioned the practice of some veterinary surgeons who specialise in the testing of pedigreed cattle for export. I understand it is their custom to inject five doses of Pasteur's tuberculin as the initial dose, and to repeat the injection again at the ninth hour; this is in addition to the instillation of concentrated tuberculin in the conjunctiva. I often wonder if the reaction they obtain so frequently is not of the nature of anaphalaxis, and I would like Dr. Patterson's opinion on the point. In testing dairy herds for licences for the higher grades of milk I have never found any necessity for employing the method I have mentioned, as the owner is only too anxious to find out any animal in the herd that is tuberculous, and he has no wish to have in his herd any animal that is even doubtful in reaction.

Mr. JOHN SPEIR (Newton Farm, Hallside, Glasgow): I must say that I enjoyed Dr. Paterson's paper very much. The views expressed by him are more moderate than I had expected, with the exception that he seemed to be rather strong on the question of pasteurised milk. There are one or two matters to which he referred in his opening remarks which, to my mind, concern the producer, and the producer alone. He indicated that, generally speaking, producers are against the 3 per cent. standard of butter fat and 8.5 per cent. for non-fatty solids. That is not my experience as a producer, and I know the great majority of the producers are of the same mind, namely, that the 3 per cent. standard for butter fat is not too high, nor yet the 8.5 per cent. for non-fatty solids. The fact that producers sat on the Departmental Committee and that, with the exception of one member, they signed the report, goes to prove that producers generally are not antagonistic to the existing standards. It would go a long way to help producers and safeguard consumers if it were possible for milk to be sold on the basis of quality. As things are at present, the producer placing on the market a high quality of milk receives the same price per gallon as the man with the low quality. Surely, if a man is producing the goods he is entitled to be paid for them. I am very glad to say, however, that some of the larger dairymen in the city of Glasgow have recognised the inequality of the present system of payment, and to-day these dairymen are paying their producers on the basis of butter fat. The doctor has indicated that his department are assisting in Lanarkshire in having a better milk put on the market by notifying producers when the bacteria count in their milk is too high. Certain Glasgow dairymen also test their suppliers' milk for bacteria count and when it exceeds a moderate figure the supplier is notified that unless the bacteria count is reduced, his supplies will be stopped. This, to my mind, will have more effect with producers than a letter from the medical officer of the county.

With regard to the 1914 Milk and Dairies Act, under which, of course, the authorities are empowered to take samples of milk from cows where it is suspected they are suffering from tuberculosis, it has been suggested by the doctor that there is no reason for a farmer not reporting a cow so affected. I think that it is here there is some misunderstanding between the officials of the local authority and the farmers. I do not think that any well-intentioned producer would ever think of consigning milk from a cow where he thought the vessel was affected with tuberculosis. There is an old saying that "doctors differ and patients die," and this difference of opinion to some extent exists amongst the officials responsible for the administration of the Act. I have had some personal experience in this particular way, where the officials of the local authority to which the milk was being consigned alleged that a certain cow was giving tuberculous milk, and the officials of the local authority within whose jurisdiction the farm is situated stated that the said cow was *not* giving tuberculous milk. When it is possible for scientific men to make such a mistake, surely there is some excuse for a farmer failing to detect a cow with a tuberculous vessel.

Regarding the production of clean milk, I agree with Mr. Robb that it is not the premises that go to make a clean milk supply. I have seen first-class milk of a high quality and very low bacteria count produced in very inferior premises. It is right and proper, however, that the

local authority should insist on buildings being up to a certain standard, but I think it would be a mistake to fix that standard too high. Proprietors in these days have not the money to expend on erecting modern buildings or carrying out extensive alterations to the existing ones. In my opinion it is necessary to have the existing byres beam filled and the walls plastered 5 or 6 feet from the floor, and the whole interior whitewashed at least twice a year. If those responsible for the administration of the Dairy Byelaws would ask for something on these lines no reasonable proprietor or farmer would object. The essayist has referred to the confusion caused by the different grades of milk, and with this view I entirely agree. As a matter of fact, one meets many consumers to-day who are of the opinion that grade A milk is the highest grade put on the market at the present time. I do not agree with the doctor, however, that we have yet reached the day when pasteurised milk can be dispensed with, as I have always been under the impression, and I am still of the opinion, that the process of pasteurisation kills any tuberculous germs in the milk and, of course, there is no getting away from the fact that such a risk does exist with any milk supply. I would be in favour of dispensing with this grade when our herds of dairy cows in this country have been practically cleared of tuberculosis, but until that day arrives the interests of the consumer are safeguarded by this process. It is a known fact that even in tuberculosis-free herds there is an occasional reactor, and it appears to me that even from the milk supply of these herds there is an element of risk without this treatment.

Mr. W. GARDNER: I should like to add my quota in appreciation of Dr. Patterson's address, to which I have listened with great interest and enjoyment. I am sure we are all agreed that he has given us a very clear and lucid exposition of his subject.

As no doubt some of you are aware, about 20 years ago I was for two years the temporarily-appointed dairy herd inspector of the Middle Ward of Lanarkshire—hence a collaborator with Dr. Patterson in this good work, for which Lanarkshire is entitled to the credit of being the pioneer of dairy herd inspections, and ever since I have been more or less interested in the work.

You will appreciate the fact that, having visited over 900 herds and examined approximately 19,400 cows every six months in the Middle Ward alone (an area of 186,500 acres), I can claim to have had some experience and knowledge of the work. In 1909, I drew 94 samples of milk from quarters suspicious of tuberculous induration and, according to the biological returns received from the laboratory, thirty of these samples proved positive, whilst about 50 per cent. of the remainder of the samples showed evidence of the presence of streptococci or staphylococci. I had much the same results in 1908. I have not the statistics with me, but, as far as my memory carries me, I found 624 or 3.2 per cent. of cows examined presenting abnormal conditions of the udder, the commonest being simple induration 200, and 300 with atrophy. I do not know how these figures compare with the statistics obtainable now.

With reference to Dr. Patterson's remarks on pasteurisation of milk, like him, I have no use for it. If milk is cleanly produced and handled there should be no need of pasteurisation. Again, we must ever keep in mind that in attempting the cure of polluted milk by this process, we may be incurring a penalty in nutritional disease and one that has not been very well measured. I venture the opinion that you will kill "mair bairns" from indigestion and other dietetic disorders through giving them pasteurised milk than will all the tuberculous milk that is brought to Glasgow.

If I interpret British opinion correctly, it is that we should set before us the goal of a safe raw milk for the people, so produced, handled, and protected that it will keep sweet for a minimum of 24 hours, and when we have accomplished this for liquid milk for daily use it may be prophesied that the standard of all products made from it will be much higher than it is to-day. Only such a goal is worthy of a progressive people, and it is capable of attainment.

Referring to dirty milk, I quite agree with the speaker, there is much room for improvement in many places in the methods accompanying production as far as getting at the root of the dirty milk supply is concerned, but I think there is far too much placed against the old cow in his indictment.

I contend that if there was more propaganda work to educate and instruct the consumer how to protect milk, such advisory work would tend to fewer complaints.

Cleanliness is not an absolute safeguard against disease, but it is a great factor in preventing contamination. Methods and equipment are the all-important factors determining the extent of bacterial contamination on the farm. Fine buildings and expensive equipment may possess undeniable advantages, but they add to the cost of production and neither is essential. Cleanliness is the be all and end all of dairy farming. It is the personal equation that counts. A good dairymaid will, and often does, produce first-class milk amidst sadly deficient surroundings, whilst an ill-equipped dairymaid with the best appointed dairy under the sun, and all modern appliances, has been known to come short.

Consumers are equally unappreciative of the extent to which they contribute to deterioration and early souring of milk after it is placed in their hands. For the most part the consumer possesses a minimum of knowledge and exhibits a maximum of indifference to the conditions under which milk is produced and under which it ought to be retained if its best qualities are to be preserved.

Rather a good story occurs to me now of a retailer delivering milk in a Perthshire village early one morning. A customer approached him and in a careless manner she cast out the contents of her jug to the winds and says: "A pint, Robert, and here I can tell you, yer milk's no keeping very weel this weather." "Deed Jean!" he says, "I'm no surprised at that: I've seen a face or two afore noo' this morning that would turn milk." The reason of his retort requires no explanation.

You will find the housewife covering her meat, her fish, brushing and laying past her clothes with the utmost care, but she shows an indifference in the protection of milk. You will find her placing open jugs and miscellaneous receptacles overnight to collect this valuable daily commodity at the front door in early morning—to get it handed in with her letters some hours later after delivery—all for the sake of a long lie in the morning.

Referring to "weeded" or non-tuberculous quarters, I am glad to say that since the new act became operative I have not met many such quarters in my own burgh, but when occasion did arise I never experienced any difficulty in dealing with the producer when he was taken the right way, nor had I any difficulty in Lanarkshire under the 1899 Act in getting them to stop mixing the milk from the other normal quarters which "milk must not be given to the calves, pigs or fowls unless or until it is boiled" pending a clearance certificate that the damaged quarter or quarters were actively restored to the normal secretion.

The question of compensation for the loss of the milk stopped pending a biological report has been put to me by a producer, but I do not think the loss is a very serious matter if any man is conscientiously concerned in providing a clean and pure milk supply.

Speaking of the system of grading milk, until recent years the striking anomalies in the position of the public in relation to the purchase of milk are remarkable.

Milk to the consumer was so much the pint, or so much a quart, and that was the end of it. It did not matter whether the milk itself was good, bad, or indifferent. It might be white, blue, or yellow. It might be comparatively clean or extraordinarily dirty; rich in cream, or very poor. It might come from healthy cows or otherwise; have been handled by clean healthy workers in hygienic surroundings or the very opposite. Obviously, milk could never take its proper place in the national food supply as long as this hopeless way of dealing with it lasted. Personally, I think we have too many grades now.

I agree with Mr. Speir that, like all other commodities, milk should be sold according to its quality. The man who produces a superior article of high standard of chemical composition and low bacterial count is well entitled to an enhanced price for it.

With reference to Professor Robb's remarks on the ophthalmic test, I cannot say I have much faith in it—I think it is the least reliable of the three when its results are negative, but it serves a useful purpose as a control test in combination with the intradermal or subcutaneous (one or other). I have seen some striking illustrations, where you would get a profuse lachrymation—with little or no elevation of the temperature—and when you re-tested the subject with the intradermal test you had a negative result. Further, when one subject had to be slaughtered in consequence of a fracture six months after the tests, the *post-mortem* revealed no tuberculous lesions.

The disadvantages of the eye test are that the discharge can be removed accidentally or intentionally and slight injuries to the eye can easily lead to confusion and, no doubt, differences of opinion as to its value are due to potency of tuberculin, differences in technique, and the period during which observations are made and their frequency.

I was glad to hear Dr. Patterson say he would be pleased to accept the private practitioner's certificate on the tuberculin test of a herd for a prospective applicant for a licence—until their authorities made the official inspection.

I test several hundreds of cows in the Carrick District of Ayrshire and, personally, I find that Mr. Douglas, the County veterinary inspector for Ayrshire (whom I regret is unable to be present with us to-day) is quite agreeable that the private practitioner should do the "weeding out" business by the prescribed tests recommended by the Board of Health. Once you have eliminated all the reactors—in other words, when you have a "clean house"—the producer makes application to our county authority for the official test.

I quite agree with Professor Robb that environments or change of surroundings may often have a prejudicial influence on subcutaneous test. I have found, in practice, that if you bring in a batch of out-wintered heifers to the byre you invariably get a few reactors. Re-test these again in three months when they have become acclimatised to the housing conditions, and you will have a different result. Several conditions will cause variations to the temperatures of normal animals. After milking you may get a slight rise. When food is given you will have a rise of from ·5° to ·7° F. in the first hour followed by a fall in the next two hours. Pregnant cows react slightly and likewise newly-calved cows.

Animals showing evidence of any acute disease or showing pus formation should never be tested, nor cows with partial retention of the placental membranes. My objection to the subcutaneous test is that it lends itself to be tampered with by unscrupulous persons. The leaving of thermometers for the taking of temperatures by laymen is a procedure that should never be adopted. It has brought this test into disrepute and I am firmly of the opinion there would be more reactors found if the thermometer was read by the operator.

In conclusion, speaking of graded milk, I am glad to say that in the town of Ayr the demand is greater than the supply, and we have more grade A certified milk coming into the Burgh of Ayr than there is into any other town of similar size in Scotland. The people of Ayr cannot get enough of it.

Speaking generally, the market for our milk is at home, and we have not got it. It is said to be a common thing in America that a labourer lays down his pick and shovel to have a drink of milk. You will go a long way before you find that kind of labourer in Britain.

I hold, and rightly so, I am certain, that if consumers were convinced and appreciated the ideal conditions (compared with those prevailing in foreign countries) under which our milk is produced, they would turn a deaf ear to anti-home propaganda and consign all such pamphlets to the wastepaper basket, and never let tinned milk of any variety cross their lips.

The Reply.

Dr. Patterson: I have to thank you for the very cordial and appreciative manner in which you have received my lecture. I fear I cannot answer all the questions in the time at my disposal, but I shall reply to the more important ones.

Replying to Mr. Robb, with regard to cleanliness and extra expense in production, I cannot see there is much more expense in the washing of hands, overalls and cows' udders, and in keeping the place generally clean. It would be different with the equipment required for a certified or graded herd, which is probably what Mr. Robb means. I quite agree that structural alterations have probably little bearing on clean milk production, but one must attend to the health of the cow, which is what the Byelaws aim at as well as cleanliness. We have no intention of being harsh with the farmer but to help him in every way we can. I am in sympathy with the farmer with regard to the reporting of a tuberculous udder, because I fear that no veterinary surgeon would take such a responsibility without obtaining a bacteriological examination of the milk for the presence of the bacillus. It should be remembered, however, that the onus is on the farmer under Section 14 of the Milk and Dairies (Scotland) Act, 1914, to report in writing to the local authority *any condition liable to infect the milk supply*, which includes mammitis, a requirement which is seldom complied with. The double tuberculin test is prescribed by the Board of Health, *i.e.*, one of the dermal tests along with the eye test.

Concerning Mr. Speir's contribution, the sale of milk on its fat content basis is a matter for arrangement by the purchaser. It has been said that the bacteriological examination of milk for the tubercle bacillus is unreliable, but I cannot say that is my experience. In Lanarkshire all doubtful and negative samples of milk are subjected to the guinea-pig inoculation test. Yes, one is allowed to have the reactors in a separate byre on the farm, as the Order states "to be removed from the herd." At the same time, I am very much against such a procedure, as the coming and going between the two herds is apt to carry infection.

Pasteurisation properly carried out does kill the tubercle bacillus. I agree with Mr. McGregor that it has frequently been found that there are more germs in milk after passing through a pasteuri-er. The hæmolytic test is employed to distinguish the virulent streptococci, but one never can tell when a non-virulent organism may become a virulent one. My experience with tuberculin is limited, but I cannot see how it could produce anaphylaxis, as it is only an emulsion of the germ itself.

With regard to the testing of uncalved cows by the official veterinary inspector, to which reference was made by Mr. Taylor, I am not aware that this is being practised in Lanarkshire and the Act only deals with cows in milk. I hold that it is up to the farmer to clear his herd of reactors, by the aid of his own veterinary surgeon, before he applies for a licence and, to expedite the granting of such. I am quite willing to accept the private veterinary practitioners' certificate if he has carried out the double test (*viz.*, dermal and eye test) within the specified period. I cannot accept the dermal test alone. Immediately a farmer applies for a licence his herd is examined and his premises are inspected, and the produce of the herd examined chemically and bacteriologically at the earliest possible moment. If everything is in order his licence is granted without further delay.

In reply to further questioners, there is no power given to seize the cow suffering from streptococcal mastitis and no compensation is paid. The Act, Section 13, only requires that the milk of said cow must not be used for human consumption.

Instructions to consumers with regard to cleanliness and drinking more milk are given by the Health Visitors and

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CLINICAL AND CASE REPORTS.

Pica in Dogs.

By Professor A. R. SMYTHE, M.R.C.V.S., D.V.S.M.,
London.

Although the ingestion by dogs of foreign bodies is not an unusual occurrence and is met with frequently in the course of canine practice, the following cases appear to diverge from the ordinary type, and to be worthy of record.

The first two photographs illustrate cases occurring in two Alsatian puppies between four and five months old which came under the care of Mr. F. G. Buxton, of Highgate, and Mr. Buxton has been kind enough to supply me with clinical details and history.

The first case was submitted for treatment, showing symptoms of gastro-intestinal disturbance and marked emaciation. There was no knowledge of any foreign body having been swallowed, but the owner had noticed a peculiar sound and stated that the dog " chinked " when he moved.

Abdominal palpation left no doubt as to the presence of foreign material, and enquiries into the history made it equally certain that this material had been *in situ* for a period of not less than ten days.

Surgical interference was at once decided upon; the stomach was then seen to be in a very congested condition, but no perforation of the walls was evident.

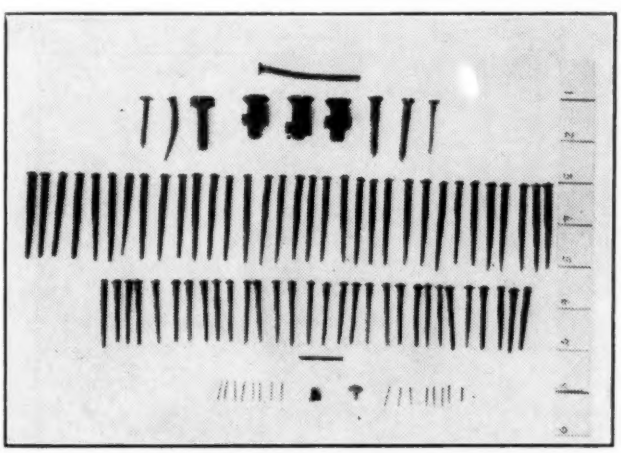


Photo 1 shows the material removed during the gastrotomy, which material may be tabulated as follows:—

1—3in. nail.
33—2in. nails.
30—1½in. ,,
3—1in. ,,
2—1¼in. screws.
3—1in. bolts with nuts.
1—2½in. bolt.
16 brads.
1 stud, 1 piece of drill, 1 piece of coal.
Total weight about 15 ounces.

This animal progressed for four days after the operation and then collapsed.

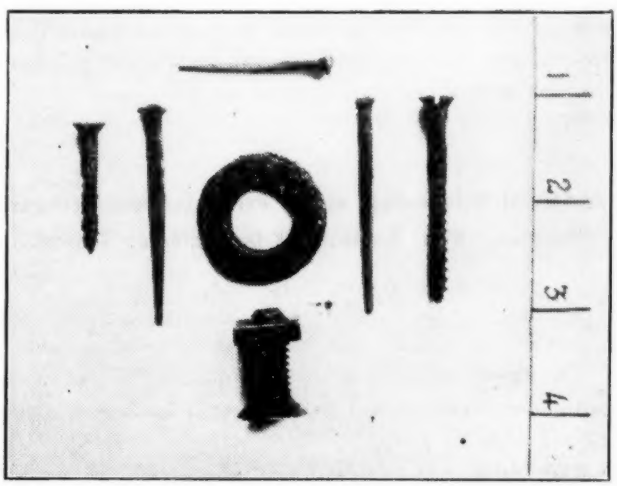
The second photograph shows an assortment of items which were partaken of by a litter sister about the same time, and which were passed per anus. The record is incomplete, as some of the bodies were not recovered.

The symptoms shown were those of anorexia, fæces more or less normal in consistence, some evidence of abdominal pain, as shown both by palpation and by whining and crying at times.

A metal washer, not shown, was the last thing to be passed, and the history points to its having been retained in the alimentary tract for a number of days. During its passage through the bowel it caused acute pain and very marked prostration. This animal recovered and is still in good health.

It is not without interest to note that these animals normally received a mixed diet of Osoko, Melox, Lactol, meat and rice.

The source of the nails, etc., had been a box kept at the end of the garden which these animals had upset.



The third photograph shows a collection of screws, nails and iron rust scale (the last weighing two ounces) removed surgically from a three-months' old Greyhound puppy admitted into the out-patients' department at the Royal Veterinary College, Camden Town.

The various objects were swallowed on the day before admission and were the cause of very acute abdominal pain and also efforts of vomition. When admitted this animal was very prostrate and was comatose. Gastrotomy was performed and the iron scale was found to be impacted

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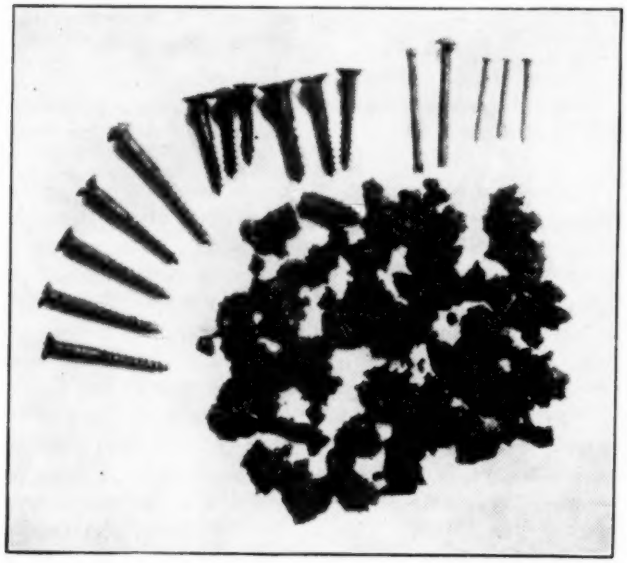
(Continued from previous page.)

Nurse Inspectors on their daily visits in Lanarkshire. All the hospitals in Lanarkshire are supplied with grade A (tuberculin tested) milk, except one, where there is no licence holder near enough to supply.

I am not an advocate of clean milk competitions, as I consider that all milk should be clean. The method adopted in Lanarkshire is meeting with excellent results. Whenever a farmer's milk supply is found to be dirty, a visit is paid to his farm by the sanitary inspector at milking time, and any discrepancy in his methods is pointed out to him.

into the lower portion of the œsophagus and the cardiac portion of the stomach, where the sharp edges had caused multiple, minute perforations. The animal rallied very much after operation, to develop a profuse diarrhœa and to succumb thirty hours later.



Post-mortem showed no peritonitis or the presence of any other foreign body, but the mucous coating of the upper bowel was stained black, probably by that portion of the iron rust which had become soluble and so carried along.

The presence of arsenic suggested itself and some of the material was submitted to Dr. Clough, who kindly analysed it. He reported that the merest traces were present, and that the quantity was insufficient to cause toxic symptoms.

Abnormal Relationship of the Perforatus and Perforans Tendons, with Rupture of the Extensor Tendons.

By J. K. Shaw, M.R.C.V.S., London.

The accompanying photographs illustrate the deformity in the near hind leg of a heavy draught horse as a sequel to influenza.

The animal was admitted to the infirmary in January last suffering from influenza of a mild type, from which recovery occurred in about fourteen days, and the animal marked convalescent as he was doing generally well.

One morning, about four to five weeks after date of admission, the animal appeared to have difficulty in moving over in the box. Examination showed lameness of the near hind leg with dropping of the quarter.

Treatment was carried out for quarter lameness and the condition improved, there being no atrophy of the quarter muscles, and the animal moved fairly well. About this time a slight swelling around the fetlock joint was noticed, more especially anteriorly, this gradually increased daily. Fomentations, liniment and bandages were used with no effect ; the foot was again thoroughly searched with negative result, no pain being evinced whatsoever.

Gradual wasting of the muscles of quarter occurred, and the deformity of the fetlock increased daily so that finally, as the condition appeared to be permanent, the animal was destroyed on July 1st last.

Post-mortem dissection revealed an enormous amount of dense, white fibrous tissue around and below the fetlock joint which so hampered further dissection that the foot was finally cut in half vertically from before backwards. The abnormalities revealed were as follows : the extensor tendons were lost in fibrous tissue from the fetlock joint downwards, the synovial bursa in front of the fetlock being obliterated. The perforans and perforatus tendons were distinct and the synovial sheath intact, but below this point, where the perforans should pass through the perforatus, there was no disunion of the latter, only the natural widening which continued downwards for about three inches, and then tapered off again to be finally lost with the perforans amongst the fibrous tissue, although traces of the perforans and possibly also the perforatus could be traced down to the semilunar crest of the os pedis. Examination of the bones themselves after maceration showed no abnormalities whatsoever. It is assumed that the condition arose from rupture of the extensor tendons below the fetlock, but what of the relationship of the perforatus and perforans ? I should be glad to have the opinion of any reader who has experience of the condition.

ABSTRACT.

On the So-called Pentastoma Nodules in the Mesenteric Lymph Nodes of Cattle. By Dr. GEORG BUGGE. *Berl. Tier. Wochenschr.*, Vol. 43, May 13 and 20, 1927; pp. 309-312, 325-329.

The material investigated was obtained from the Berlin slaughterhouse. In preliminary investigations the author found isolated living Pentastoma larvæ in their later stages, in the cavities and ducts of the mesenteric lymph nodes; but in several thousands of yellow green foci in the mesenteric lymph nodes which he examined he was unable to detect the remains of larvæ, and was able to distinguish these foci from tuberculous ones.

Living Pentastoma larvæ, in their later stages, were found during the months of August to December, but no causal connection could be shown between cavities containing P. larvæ and the so-called Pentastoma nodules. The green nodules were found only in summer and autumn, and the older greyish green nodules in normal winters, and in exceptional cases up to February, the mesentery being almost free from February to May but, as no immunity was conferred, the processes could re-appear the following year.

The green foci were frequently found to be present together with infestation of the liver with fluke. In quite a number of mesenteries with typical green foci, immature stages of trematodes were found which were easily destroyed by potash lye.

The contrast between the frequent occurrence of green foci and the infrequent occurrence of Pentastoma larvæ in the mesenteric lymph nodes of the cattle was very marked and the conclusion is drawn that the two species of focus are not to be ascribed to the same cause. D. K.

STUDENTS' CONTRIBUTIONS.

Mercury Poisoning in a Two-year-old Heifer.

By A. J. KENNEDY, Edinburgh.

History.—The heifer had been tied in a cowshed for some time, for convenience in dressing a skin eruption, which had extended over the back, withers, neck and round the eyes. Mercury soap had been applied after thoroughly washing and drying the part. The same (one in five) preparation had been used with much success in treating many cases of skin eruptions in cattle and horses. In this case treatment had extended over six weeks, and the skin seemed now healthy and free from exudate. The last application had been applied ten days before.

The owner first noticed something amiss a day before the veterinary surgeon was called in, when the animal was noticed salivating profusely, and off her food. She seemed better at night but next day was blowing hard. A temperature of 102.8°F. was then registered.

Symptoms. 3 *p.m.* Dull and unable to rise; pulse 80 and weak. Temperature 108°. Conjunctiva injected a dull red.

Alimentary system.—The mucous membranes of the mouth were of a bluish tinge and there was some ulceration of the hard palate. The fæces were normal in amount and consistency.

Respiration.—Marked dyspnœa; auscultation showed harsh bronchial sounds over the whole lung and a subdued crepitation over the left cardiac lobe.

Nervous and muscular—Besides inability to rise, the swallowing reflex was practically gone, the animal holding food in the mouth and chewing mechanically.

Diagnosis. A complete diagnosis was not made. Mercury poisoning was considered, but was not thought capable of being the whole cause of the condition.

Treatment.—Combating the symptoms—(1) the patient's head was pulled round to an open door and water placed in front of her, of which she drank two or three gallons. (2) Ammon. carb. and salicylic acid were given mixed with treacle. (3) An injection of strychnine was made. The owner was instructed to wash the skin eruptions thoroughly with soap and water.

Same day 9 *p.m.*

Symptoms.—Pulse somewhat better. Temp. at 5 p.m. had been 104.6°. It was now 103.4°. Patient unable to rise. Urine hæmorrhagic.

Treatment.—Potassium iodide and mag. sulph. in treacle as antidotes.

2nd Day. 8 *a.m.*

The heifer was now in a state of coma; eye shrunken, pulse almost imperceptible, temp. 101.3°, conjunctiva an exceedingly dull red.

Death supervened at 12 o'clock.

Post-mortem.—Findings were: Lungs—commencing hepatization round caseous tuberculous areas over half the left cardiac lobe. Alimentary system—mouth ulcerated and somewhat blue in colour, as were also the mucous membranes of the rumen, abomasum and bowels. Spleen congested. Urinary apparatus—kidneys normal to the naked eye, inflammation of the bladder.

Analysis of the kidneys, spleen, bowel wall, and liver by the public analyst showed mercury present.

The presence of the pneumonia was a coincidence, although it probably helped to raise the temperature to 108°. The mercury in the tissues was at the root of the trouble, and the heifer must have been peculiarly susceptible to the poison.

Foreign Body in Stomach—Dog.

By J. W. H. HOLMES, Edinburgh.

Subject.—Fox-terrier dog, eighteen months old.

History.—The dog had appeared in good health until the morning of 21st August, 1926, when he had refused his food and appeared generally ill. He had vomited

and had been shivering. The animal had not had any previous ailment. Four other dogs kept in same house all appeared in good health.

Symptoms.—The animal appeared "out of condition," thin and in poor coat. He appeared "tucked up," enlarged in the liver region and depressed. There was no rash on the inside of thighs. The pulse was irregular and temperature normal. On palpation of the abdomen a hard round object was felt on the left side below the last rib.—Foreign Body in Stomach ?—However, owner said that the animal had not been seen to pick up anything abnormal.

Diagnosis.—In view of last statement, treat for gastric form of distemper (gastritis and liver affection), but if no change to-morrow treat for foreign body in stomach.

Treatment.—Gave chloretone caps. grs. v.

Medicine for Fox-terrier Dog.

R. Mist. bismuth c. pepsin ℳlxxx
Aquam ad. ℥i
Ft. mist

Sig.—Two teaspoonsful to be given every four hours in a little water.

22/8/26.—Dog still very depressed. Pulse irregular. Temp. normal. On palpation it still appeared as though there was a foreign body in the stomach. The animal's bowels had not acted since yesterday morning. None of the four other dogs in the house showed any signs of illness.

Diagnosis.—Foreign body in stomach. This in view of normal temperature and also in view of the fact that none of the four other dogs showed signs of illness.

Treatment.—Gave two teaspoonfuls of table salt and half-teaspoonful of mustard in ℥ii warm water.—Dog vomited greenish brown fluid and two long tape worms, but nothing else.

Gave instructions for two chloretone caps. (grs. v) to be given in half an hour.

Medicine for Fox-terrier Dog.

R. mist. bismuth c pepsin ℥iij.
Aquam ad. ℥iv.
Ft. mist.

Sig.—One tablespoonful to be given every four hours, in a little water.

23/8/26.—Dog much brighter. On palpation of abdomen hard object not present. The animal's bowels had not acted, so gave soap and water enema. Left instructions for three more doses of medicine to be given and then carry on as usual. *The owner now recollected that dog had eaten a rabbit's skin.*

Later heard that animal made an uneventful recovery.

Canine Jaundice.

By W. P. Blount, Edinburgh.

A series of three cases of infectious canine jaundice, and one of jaundice suspected to be of like origin—*i.e.*, leptospiral fever.

History.—Three fox hounds of the local Hunt were visited, suffering from an infectious jaundice. All visible mucous membranes were decidedly yellow, there was much sickness, diarrhœa with blood and the well-known smell associated with this disease. One hound was dying, one very ill and one less ill. Recent research work having associated the leptospiral organism as the causative factor, treatment was thus given.

Treatment.—A 10 cc. intravenous injection of navarsenobillon, a bismuth mixture twice daily and forcible feeding with Brand's essence of beef. One dog was immediately destroyed and a *post-mortem* made. The second dog died and the third recovered.

Post-mortem.—P.M. examination of the two deaths revealed two interesting conditions—a complete intussusception of a portion of the large bowels in two places and the fact that the visible coats of the larger arteries of the body were yellow, most especially the thoracic aorta. The veins remained normally blue. So yellow was the aorta that it might easily have been mistaken for an enlarged thoracic duct full of chyle. Bowel distension and inflammation were observed. The liver was pale and spotted, tearing unusually easily. Heart normal, though the accompanying fat and pleura were yellow, too; kidneys enlarged; the bowel contents were dark, bloody, and full of a black gritty material. Spleen was rather pale and had darkened patches on it. The second hound had three invaginations. The visible mucous membranes externally were all yellow, as was the ventral surface of the abdomen.

The fourth case of jaundice was in a Spaniel and followed one month after distemper. Temperature was 104°F. and the membranes again were yellow, sickness was present, diarrhœa, and the dog was off feed. At once a 10 cc. injection of salvarsan was applied intravenously. No other treatment was adopted beyond an initial dose of bismuth. Meat juice and milk were forcible fed and recovery accomplished in four days. At the commencement this appeared a very serious case.

Remarks.—Apparently if caught in time infectious canine jaundice is amenable to Salvarsan treatment. To distinguish between true leptospiral fever and after-distemper jaundice may be difficult sometimes.

Experiments on Living Animals.

Home Office Report.

A Home Office White Paper relating to experiments on living animals in Great Britain during 1926 has been published by the Stationery Office (price 1s. net).

It is stated that the total number of experiments was 266,478, being 57,464 more than in 1925. The number with anæsthetics was 12,637. With reference to 253,841 performed without anæsthetics, it is stated that they were mostly inoculations, but some were feeding experiments, or the administration of various substances by the mouth or by inhalation, or by external application, or the abstraction of blood by puncture or simple venesection. In no instance had a certificate dispensing with the use of anæsthetics been allowed for an experiment involving a serious operation.

During the year 15,167 experiments were performed by eleven licensees in the course of cancer investigations. A large number of experiments, almost wholly simple inoculations and similar proceedings, were performed either on behalf of official bodies with a view to the preservation of the public health or directly for the diagnosis and treatment of disease. Two hundred and twenty-four licensees reported over 62,000 experiments which were performed for Government Departments, the Medical Research Council, county councils, municipal corporations, or other public health authorities; and 57 licensees performed over 123,000 experiments for the preparation and testing of antitoxic sera and vaccines, and for the testing and standardising of drugs.

In the course of the year the several registered places had been visited frequently by the inspectors and a large number of experiments had been witnessed. For the most part visits were made without previous notice. The animals had been found suitably lodged and well cared for. Four irregularities were reported during the year. In one case a licensee performed experiments in excess of the number allowed under the conditions attached to his certificate. As the infringement was the result of carelessness, and in view of his position as the head of a laboratory, he was severely admonished and the certificate disallowed.

The total number of licensees was 1,160, and the reports showed that 281 performed no experiments.—*The Times.*

DIVISIONAL REPORT.

Mid-West and South Wales Division.

MEETING AT THE ROYAL SHOW.

A very full day of enjoyment was spent by the members of this Division on Thursday, July 7th, when to the pleasure of meeting was added the opportunity of visiting the Royal Show at Newport. The following veterinarians met in the members' tent in the afternoon under the Presidency of Mr. J. L. Perry: Messrs. J. R. Barker, J. W. Baxter, W. T. Edwards, E. P. Evans, J. R. Hewer, F. C. Hobbs, J. Howard Jones, J. W. H. Masheter, J. S. Pike, C. E. Perry, A. J. S. Reynolds, H. S. Robinson, J. V. S. Rutter, B. Sayer, E. Sayer, J. Stewart, C. D. Watkins, M. E. Williams, W. R. Williams, and W. D. Rees (Hon. Secretary).

Apologies for absence were received from Messrs. A. S. Adams, W. A. Austin, R. W. Hall, and R. Moore.

The minutes of the previous meeting, which had been published in the *Record*, were taken as read and were confirmed.

Arising out of them, the HON. SECRETARY said that, on behalf of Mr. Aveston, who was unfortunately prevented from attending, he desired to move the election as an Honorary Associate of the Division of Dr. H. Colston Williams, Medical Officer of Health for the County of Glamorgan. Dr. Williams had been a great supporter of the Division and had attended a number of their meetings, while he had always shown himself to be a keen supporter of their aims and objects.

Mr. EVANS seconded the motion, which was carried with acclamation.

New Members.—Major E. S. James and Mr. C. S. Randle, both members of the Veterinary Staff of the Ministry of Agriculture at Cardiff, were unanimously elected to membership.

Place of Annual Meeting.—A recommendation of the Council that the Division hold its Annual Meeting and Council Meetings at the Victoria Hotel, Bristol, was approved.

ANY OTHER BUSINESS.

The HON. SECRETARY: At a meeting of the Council of the N.V.M.A., held in London a week yesterday, a suggestion (brought forward by a member of the South Eastern Division) was made that each Division should form a Section of Veterinary Inspectors. I should like that suggestion to be considered here to-day and for us to decide whether the veterinary inspectors in our Division should form a special section.

The Council thought the suggestion a feasible one and decided that a general recommendation as to its adoption should be sent to all the Divisions.

Mr. STEWART expressed the view that such a step would be advantageous, particularly from the point of view of expediting the consideration of matters affecting their veterinary inspectors.

Answering Mr. C. E. Perry, the HON. SECRETARY said that the formation of such a section would be purely a domestic matter and would in no way interfere with the County Committee set up in Gloucestershire. The inspectors of ten counties (members of the Division) would be concerned in their case, and if such a section were formed it would be known as the Veterinary Inspectors' Section of the Mid-West and South Wales Division.

The Hon. Secretary formally proposed accordingly, and the proposition was carried without dissent.

Proceeding, the HON. SECRETARY said: I do not know whether you have noticed in this week's *Record* a little paragraph headed "Pets on the Panel." I have been asked by one of the members in London to bring it forward to-day. In case some of you have not read it, I will do so:

"Horses, dogs, cats and cattle are to have their own panel doctors in Berlin," says the *Sunday Pictorial*, of June 26th. "Health insurance in that city has now progressed so far that it provides, subject to the payment of regular contributions, a benefit similar to that which is given to people in this country under our National Health Insurance Scheme. This method of treatment for the ills of animals seems a matter into which some enterprising veterinary surgeon might profitably inquire."

The question was raised at the Council meeting in London by one of the London practitioners, who wondered whether some National Health Insurance scheme for animals could be formed in this country, chiefly as a means of combatting the activities of such organisations as the P.D.S.A., which are hitting the members of the veterinary profession very hard, for not only are poor people taking advantage of their services, but a number of those with money. I do not think that we can do anything in the matter now, but we might consider it for a moment. It is a very difficult problem, however, to know how any such scheme can be worked; it could not, I think, be worked on a national basis, but perhaps something more or less local in its operation might be devised. This matter was referred to a Committee of the "National" for consideration.

The PRESIDENT expressed the view that even for small animals any such scheme would be ineffective, inasmuch as the average dog owner sought the services of the veterinary surgeon only about once in five years.

Mr. ROBINSON moved: "That this meeting of the Mid-West and South Wales Division is of opinion that the time is now opportune for the discussion of the question of a national panel for veterinary treatment, more especially for farmers," and that the resolution be forwarded to the Council of the N.V.M.A.

Mr. RUTTER seconded the motion, which was then put to the meeting.

The meeting rejected the motion by a considerable majority.

EXHIBITS AND CASES OF INTEREST.

Mr. MASHETER contributed the following remarks on redwater, or bovine piroplasmosis:—

As the tick season is now upon us, and having had a few cases of redwater, I thought perhaps a few words on this seasonable disease might be interesting.

The symptoms of the two cases I have to mention were typical, *viz*: inappetence, absence of rumination, rapid emaciation, staring coat, grunting, heart's action very stormy, temperature 105° and 106° F. Urine very dark coloured. Mucous membrane icteric, as was also the skin.

Treatment of these cases consisted of a full dose of linseed oil followed twice a day by powders consisting of carbonate of iron, carbonate of ammonia, aa ℥iij; pulv. nucis vomica, ℥j. This was given in a quart of cold gruel.

Both cases cleared up within a week and are now doing well. In addition, I insisted on the cattle on the holding, five in number, being groomed twice a day, using a solution of Jeyes' fluid on the brush. This grooming is to be carried out until the end of September. These cases occurred in the Forest of Dean, and the pasturage of the cattle has never been cultivated—it is absolutely wild—swampy, covered with bracken, broom, furze and the larger forest trees.

Perhaps the main interest of this "clinical case" rests in the card I am passing round, which shows the stages of development of the causal agent of this piroplasmosis, *viz.*: eggs, larvæ, nymphæ and the adult forms of the tick, *Ixodes ricinus*. These were taken from the cattle in question.

Ixodes ricinus is a "three host" tick, and takes about nineteen weeks to develop from the deposition of the egg to the dropping off of the fertilised female, provided the tick finds its next host immediately after completing its respective stages on the ground, and that the weather is suitable.

The infectivity of sexually mature ticks is still questionable. The disease is spread by the larvæ and nymphæ hatched from eggs deposited by an infested female. One hundred to one thousand eggs are laid in the grass. The larvæ hatch in about six weeks, attach themselves to a host and are engorged with blood in three to six days and drop to the ground. Here they remain while undergoing the change to the nymph stage—about four weeks. They again attach themselves to an animal and remain for three to five days, drop to the ground and develop into mature ticks within eight weeks. The mature ticks again seek the body of a host, engorge themselves and copulate.

Cattle which have passed through an attack of the disease are usually immune against later infections.

This life history is taken from Hutyra and Marek, page 956, 3rd edition.

Mr. PIKE asked if any of the members had, in dealing with redwater cases, used the intravenous injection of trypan blue and, if so, with what results.

Mr. E. SAYER instanced the case of a cat from which three ticks were removed, which was very much off colour, and he was of opinion that the animal was suffering from some form of malaria in consequence of the presence of the ticks.

Mr. EDWARDS exhibited a large calculus, removed from the parotid duct of a twelve months' old horse. Professor Williams had said that he had never seen another such case. The horse was operated on with success and was sold subsequently.

Mr. W. R. WILLIAMS said that he thought that Mr. Hall Masheter had spoken of using linseed oil in cases of redwater. It was always the custom to give some physic in the first stages, and he wondered whether the physic had any effect on the disease or whether it was given just "to fill in the time," as it were. He tried typan blue once, but it had no effect at all. In Devon and Cornwall they had been treating these cases by the injection of tartar emetic: there were some instances of this reported in the *Record* some years ago, but he thought that as many cures were obtained by the oral administration of medicines as by the intravenous injection method, which required great care in its application. The idea of the tartar emetic injection was the late Sir Stewart Stockman's.

Mr. HOBBS said that in his district there was one farm where redwater had been a regular occurrence yearly. He gave quinine in good strong doses, and did not advise purgation. On that farm eight or nine cows were kept, and it was one on which fern had grown abundantly. He advised them to keep the fern cut down, but the disease still recurred every three or four years. One or two of the animals might die, but they were generally very old if they did succumb. He told the owners to keep the animals very quiet, and if they did not do so the old cattle dropped dead, as the heart gave out. He administrated ℥ss quinine and gave from three to five doses in draughts. One farmer who used to commence with purgatives invariably lost his animals, but the mortality had ceased since the speaker's advice had been taken to discontinue them and administer his draughts (containing quinine).

Mr. J. R. HEWER suggested the intravenous injection of quinine hydrobromide.

Mr. J. R. BARKER said that the treatment of cases in South Devon by antimony tartrate, as advocated by Sir Stewart Stockman, was productive of excellent results. No medicinal treatment was required in addition to the intravenous injection of 7½ grains of the antimony tartrate; in fact, if that drug was administered when others had already been prescribed it would produce shock. By this method cases would clear up within forty-eight hours. The piroplasm lived within the blood cells, and antimony tartrate injected into the vein would get right at the seat of the trouble and much more readily than would either salts or quinine. He had found that the difficulty with those redwater cases occurring in out of the way places was that the farmers treated their animals themselves and there only remained the chronic cases for the practitioner to treat; in such cases the intravenous method of treatment was exceedingly efficacious. He had written Mr. Macdonagh concerning the intravenous injection of antimony tartrate, and the latter had informed him that the best way in which to inject this drug was to dissolve it in 10 c.c. of water and draw that up into a 20 c.c. syringe; then to take up some of the blood to fill the syringe. That procedure obviated shock, the withdrawn blood acting as a shock absorber and one could get the animal to remain still while the injection was being made. He (Mr. Barker) had experienced great difficulty in getting the cows to stand still when injecting a great quantity into the vein. The last case he had in which he had adopted the method he had outlined, had cleared up quite nicely.

Mr. J. V. S. RUTTER exhibited a diseased fetlock joint from a two-year-old, together with some photographs taken before the animal was destroyed. It was a cruelty case, the owner being fined three guineas and costs after running it out in a field by the road, when it was seen, obviously in pain, by various people who complained. The bones of the

joint showed marked osteo-porosis and exostoses. Mr. Rutter also exhibited X-ray photographs of the fractured femur of an Alsatian puppy before and after setting.

At this point Mr. HEWER interposed the observation that he had just seen the exhibit of Messrs. Cooper McDougall and Robertson and had ascertained that they were shortly to show a film concerning sheep dipping, while there was a collection of live parasites on view. He thought these would be of interest to the members.

The meeting expressed agreement.

The PRESIDENT, continuing the clinical discussion, said that a friend of his had a perineal fistula, of which he was cured after treatment at the Cardiff Infirmary. The doctor who had the case in hand there had told him of a method of tracing out such a sinus—the injection of 5 per cent. methylene blue half-an-hour before operation. By that method the path of the sinus became clearly marked out. He thought that method might be of use in certain cases in veterinary practice in which it was difficult to trace the sinus.

Mr. HOWARD JONES asked if any of those present had met with a condition described by Moussu and Dollar as pseudo-rheumatism of adult cattle. He had experienced a case the other day which answered the description given wonderfully. The subject was a three-year-old heifer, and the owner was prosecuted by the R.S.P.C.A. for not having taken care of the animal, which could not move. He was called in and found her down in the field and in a terrible state of emaciation. Upon giving her assistance to rise he found that both stifles were enormously swollen and that she could not place the right hind limb on the ground at all, while she could barely move on the left. On moving the right limb one could hear a grating sound, and he thought there was a fracture. The Society's man came along and destroyed the beast and he (the speaker) made a *post-mortem* examination. He found that in addition to the tremendously inflamed condition of both the stifle joints, with a thickened synovial substance, the cartilaginous tissue was almost entirely eroded and that the marrow was in a state of thick congealment. He tried to preserve the specimens, but in boiling out the bones everything else had been destroyed. He thought that the animal had suffered from starvation as she could not move to get food or water.

The man got off completely—the magistrates who heard the case were all farmers! (Laughter.) Moussu and Dollar's book contained the only description at all fitting the case which he could find, under the heading Pseudo-rheumatism of Adult Cattle, which corresponded with the history and lesions found to be present.

Mr. C. E. PERRY remarked that he had had a similar case reported to him some time ago—a Friesian cow which was a suspect under the Tuberculosis Order. To make sure, he took some of the fluid from the stifle joint and sent it to Professor Walker Hall. The result of the examination was that it was a streptococcic infection, teeming with streptococci. There was erosion of the cartilage and on movement of the joint there was a crackling sound.

Mr. HOBBS stated that Muller described the condition as arthritis deformans; it was noticed in horses particularly.

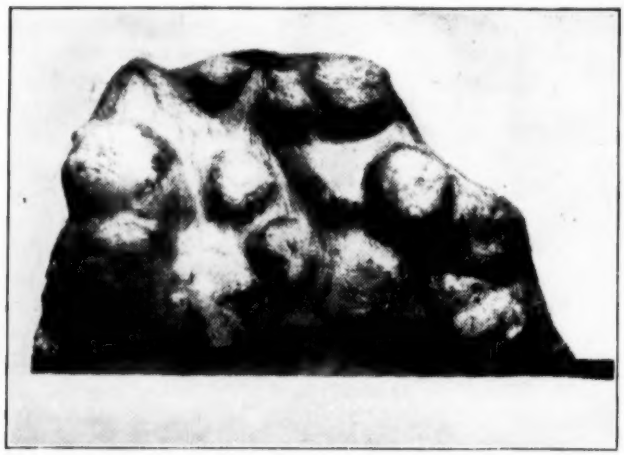
Mr. HOWARD JONES said that he had recently mentioned to the members of the Division an instance of the failure of the intradermal tuberculin test to give a reaction in a very advanced case of tuberculosis; he had, unfortunately, had another case very recently. It was a cow reported to him by Mr. Hall as being a case of suspected tuberculosis. She was almost unable to rise and she showed a certain amount of emaciation. The one outstanding symptom was that she was passing blood with the urine. He (the speaker) subjected the cow to the test, and she showed no reaction to either the intradermal or the ophthalmic form. On slaughter the cow was found to be most definitely tuberculous—the pelvic contents were massively infected. The bladder was sent up to Sir John M'Fadyean and he (Mr. Jones was told) had put it in his museum as a specimen. The hilus of the kidney was also one mass, although the kidney substances themselves did not show lesions. He mentioned the case to Professor Buxton, of Cambridge, who said that he also had seen several cases of such advanced tuberculosis that they would not have responded to any form of tuberculin test.

A MEMBER remarked that he did not think there was any doubt that there were cases in which tuberculin produced no reaction. He thought that Mr. Howard Jones had said that his case was nearly dead, and one would not expect a reaction in a cow in such a condition, for she would be incapable of producing a reaction. He had recently had a case of suspected tubercle in a horse and he had tested him with tubercle in the eye as was done with mallein in the army. A beautiful reaction resulted and on slaughter tuberculosis of the spleen was found. That was not to say that the palpebral test was just as good—he thought the intradermal test was undoubtedly the best.

Mr. C. E. PERRY said that he had a similar case to that cited by Mr. Howard Jones some months previously. He was called in consultation by Mr. Bovett, of Bridgwater, concerning a very valuable Friesian cow, which had been injected with tuberculin subcutaneously, ophthalmically and intradermally, and had failed to react in each case. The milk, also, had been sent to the Bristol and Cambridge Universities, and both had returned negative reports concerning it. The animal was, however, clinically tuberculous, and she was consequently slaughtered under the Tuberculosis Order, when an advanced condition of tuberculosis revealed itself. There again was a case in which the disease was too extensive for the tuberculin to produce a reaction.

Mr. STEWART detailed the case of a horse in a debilitated condition, the teeth of which he had filed, as they were very bad. The condition of the animal, after an initial improvement, went, however, from bad to worse, the temperature fluctuated between 103°F. and 104°F., and on examination *per rectum* he thought he could feel some enlarged glands. The probability of the presence of tuberculosis struck him and he decided to test.

The production of a reaction enabled him to express a definite opinion that the case was one of tuberculosis. The owner was reluctant to slaughter, however, and turned the animal out to grass for three months, when he asked him to look at it again. He did so and found that it was as much as the horse could do to walk from the field to the stable. Destruction was then determined upon and upon *post-mortem* it proved to be as rotten a case of tuberculosis of the horse as one could see—the spleen would fill a wheelbarrow.



TUBERCULOUS EQUINE SPLEEN IN MR. STEWART'S CASE.

That animal reacted, which showed that some animals that were advanced cases of tuberculosis would react to tuberculin. In another case in which he thought he could feel enlarged glands *per rectum* in the horse there was no tuberculosis evident on *post-mortem*, but the gut was full of ulcerated areas, many of the lesions coalescing.

This terminated the clinical portion of the proceedings, and the PRESIDENT said that he was sure that they had a very interesting discussion and that he wanted to tender his personal thanks to those gentlemen who had contributed to a discussion from which they had all learned something.

Next Meeting.—For the next meeting of the Division, to be held at Cardiff, on the third Friday in October, Mr. Howard Jones kindly promised to prepare a paper.

The meeting concluded with a vote of thanks to the President for his conduct in the Chair.

W. D. REES, *Hon. Secretary.*

NOTANDA.

Some of the diseases caused by ultramicroscopic agents are avian plague, blue tongue, distemper, catarrhal fever of sheep, cattle plague, contag. pleuro-pneumonia (almost ultravisible), foot-and-mouth disease, heart water, infective venereal granulomata (dogs), rabies, sheep pox, South African horse sickness and swine fever.

. . . . . .

To convert the degrees of Centigrade into those of Fahrenheit multiply by 9, divide by 5 and add 32. To convert Fahrenheit into Centigrade subtract 32, multiply by 5 and divide by 9.

. . . . . .

Antoni van Leeuwenhoek (1632-1723) of Delft, great microscopist, gave the first complete account of the red blood corpuscles (1674) and was the first to see protozoa under the microscope (1675).

. . . . . .

Hypochlorites are incompatible with all acids and alcohol and care should be taken to avoid mixing hypochlorites with readily oxidisable substances, with which they are dangerously explosive.

. . . . . .

Haephestion, friend of Alexander the Great, being ill, was placed upon a strict diet. During the absence of his physician at the theatre he ate a roast fowl and drank a flagon of iced wine, as a result of which he died. Whereupon, Alexander had the physician crucified.

. . . . . .

In the year 1812 iodine was discovered by B. Courtois; and in 1832 chloral was discovered by J. von Liebig.

H.K.

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events.

Aug. 8th—Meeting of the Editorial Committee, N.V.M.A., at 4-30 p.m.
Aug. 11th—Meeting of the Midland Counties Division at Stamford.
Aug. 22nd—Last day for entry to R.C.V.S. Jubilee Memorial Bursary Examination.
Sept. 12-17th—N.V.M.A. Congress at Torquay.
Sept. 22nd, 23rd.—Examination at R.C.V.S. for Jubilee Memorial Bursary.
Oct. 5th—R.C.V.S. Committee Meetings.
Oct. 6th—R.C.V.S. Committee Meetings.
Oct. 7th—R.C.V.S. Council Meetings.

R.C.V.S. OBITUARY.

ARMAN, Thomas John, 18 St. Luke's Road, Maidenhead. Graduated London, 28th May, 1894. Died 23rd July, 1927.

NURSE, Rupert Guy. March, Cambridgeshire. Aged 27. Graduated, London, July 13th, 1921. Died 27th July, 1927.

MR. R. NURSE'S TRAGIC DEATH.

The following account is taken from *The Cambridgeshire Times* of Friday, July 29th:—

"A terrible accident, in which a very popular young March man received injuries which proved fatal, occurred on the road between Wimblington and March, on Tuesday evening.

"Mr. Rupert Nurse, assistant to Mr. H. H. Truman (March) as a qualified veterinary surgeon, was motor cycling home to March, after taking part in a cricket match at Wimblington, when a collison occurred between his machine and a pony trap, which he hit in the rear. Both vehicles were proceeding in the same direction, and when the impact occurred, deceased's machine, which was one of the latest Douglas models, burst into flames, and could not be extinguished. Mr. Nurse was thrown heavily, and sustained such severe injuries to his head that he succumbed at his own home, where he was conveyed a short while afterwards.

"The news of the death of such a promising and popular young man cast a gloom over the town of March, of which he was a native. He had only passed his 27th birthday about three weeks ago, and the mishap is rendered even more sad by the knowledge that he was looking forward to taking his vacation at the end of the present week.

"Receiving his education at March Grammar School, the deceased went as a pupil to veterinary surgery with Mr. H. H. Truman, after which he proceeded to the Royal Veterinary College, Camden Town, London, to qualify for his profession. This he did in 1921. In an examination for first year pupils he won a medal presented by the Duke of Connaught, for being the most efficient student. He also won a medal for chemistry and toxicology.

"While studying at the London College, the Government required his services for the Colours. He was only 18 years of age at that time, so he had to drop his studies temporarily and join the Forces. However, he was only in the Army a short while (about nine months) before the Armistice was signed and he was demobilised. Returning to the College, he again came out on top in subsequent examinations, although his studies had naturally been considerably hampered by having to enlist.

"After qualifying, deceased returned to Mr. Truman as a fully qualified veterinary assistant, and had been with him in that capacity for the past six years.

"Of a cheery disposition, deceased was ever welcomed by the clientièle, and among his chums he was, and always will be, known as 'one of the best.' He was a playing member of the March Cricket Club, an ex-captain of the town hockey team, and one of the directors of the March Sports Field. A great tennis player, Rugby player, and swimmer, Rupert, as he was best known was, in fact, an all-round sportsman.

"His mother and father are well known, and reside at 'Ashdene,' March, and he also leaves five sisters and four brothers to mourn their irreparable loss.

"At the inquest the Foreman said the jury were unanimously agreed that deceased met his death by an accident with his motor cycle, and they considered that it was through no fault of his or negligence of any other person.

"He would like to add that in the course of his duties he had met deceased as often as anybody, and had always considered him a most careful driver. The jury would like to express their deep regret at the loss of a valuable citizen, and one who was very highly respected, and they wished to convey to Mr. and Mrs. Nurse their sincerest sympathy in the great loss they had sustained.

"The Coroner warmly associated himself with those remarks."

Army Veterinary Service.

London Gazette. War Office. Reserve of Officers Regular Army.

Capt. H. A. Idenden, late Temp. Capt. R.A.V.C., to be Capt. (June 19th, 1926), with seniority March 1st, 1920.

Aug. 2nd. B. H. Gale to be Lieut. (April 24th).

H.M. Stationery Office Publications.

The undermentioned have been published during the week. Copies can be purchased through any bookseller, or directly from H.M. Stationery Office, at the following addresses:—London: Adastral House, Kingsway, W.C.2, and 28 Abingdon Street, S.W.1; Cardiff: 1 St. Andrew's Crescent; Manchester: York Street; Edinburgh: 120 George Street.

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87. Experiments on Living Animals. Return showing the number during the year 1926, under Licences, distinguishing the nature of the experiments	1	0	1	1
Parliamentary Debates, Vol. 209, No. 109. Slaughter of Animals (Scotland) Bill. Standing Committee on Scottish Bills, Second Day's Proceedings. July 26th, 1927	0	6	0	6½
House of Commons Bills, 1927.				
186. Slaughter of Animals (Scotland). As amended by the Standing Committee on Scottish Bills	0	1	0	1½
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CORRESPONDENCE.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

The Royal Commission on Agriculture in India.

To the Editor of The Veterinary Record.

Sir,—With reference to Professor Gaiger's letter in your issue of July 30th, will you permit me to deprecate the ventilation of divergent views in the public press from individuals who have been invited to give evidence before the Royal Commission on Agriculture in India? For reasons of their own the Royal Commission have asked for the opinions of persons who have had no experience of conditions in India, but in weighing the evidence it may be presumed that every point will be taken into consideration. In any case there is nothing to be gained from correspondence which might lead outsiders to think that the profession is not unanimous in considering that the problem in India is essentially administrative in importance. If the Government of India had the services of a capable veterinary adviser possessing adequate experience of Indian conditions the Royal Commission would be in a much better position to deal with veterinary questions. Local Indian experience is insufficient. Veterinary research work in India has a very distinguished record, but development has been interfered with by a policy of destruction.

What can be done with a Government that abolishes the head of the department (the sole co-ordinating influence) ignores the proceedings of constituted veterinary conferences, discourages the publication of research work, and rules that research institutions are to be run at a profit over and above the value of the animal life saved by their investigations and productions? The number of officers who have retired prematurely from the Indian Veterinary Service, since it was constituted as a civil service, is remarkable enough to merit the attention of the Commission. It would almost certainly be found that the resignations have been mainly due to dissatisfaction with the methods of administration.—Yours faithfully, G. K. Walker (Colonel), Indian Veterinary Service (retired).

30th July, 1927.

Epilepsy in the Horse.

To the Editor of The Veterinary Record.

Sir,—Epilepsy in the horse must be rare in the equine species, for I have only seen one case in forty-five years' experience. It occurred about thirty years ago in a carriage mare upon which I had performed median neurectomy for knee splint three days before. The mare did not shew any signs of the trouble until she was taken out of a loose box down an incline. When she was turned round to come up the incline she rushed forward and pressed her head against the wall in a corner, roared and moved her limbs convulsively for about five minutes and then gradually recovered. She did not fall to the ground. No treatment was adopted and, as this mare when put to work had several seizures in harness, she was sold under the hammer. The attack was witnessed by a French veterinary surgeon who was on a visit to me and he put it down to infection of the brain from the wound. I was, however, of the opinion that it was a reflex epilepsy.

This animal never manifested any sign of the trouble before the operation and it was quite possible that the casting might have had something to do with its causation.

True epilepsy—in contradistinction to epileptiforms arising during the course of infectious diseases, or reflex epilepsy which recurs in cases where there is a predisposition to surface irritation as with parasites, eczema, etc., in the ears or on the surface of the body—is somewhat common in dogs and cats and recurs at intervals, often periodically. It is incurable but the attacks may be checked with repeated dosing with bromides, especially

just before the attacks are likely to arise. I have known cases in which fits have continued for several years. Epilepsy generally occurs in adult or old animals but it may also have its beginnings in earlier life. Sometimes it occurs in bitches just before œstrum and reappears at each season. Such bitches are usually sterile and, as age progresses, put on fat.

There is no doubt that megrims is a mild form of reflex epilepsy and is evidently set up by the presence of mites in the ear; it corresponds to the reflex epilepsy seen in some dogs and cats with parasites in the ear, or on the skin, or irritation of the skin just before or during an outburst of eczema. Probably the reason why it occurs in some cases and not in the majority of others where these external causes are at play, is that there is some central nervous disorder or lesion which predisposes the animals to manifest convulsions.

Epileptiform convulsions are frequently seen in infectious or parasitic diseases in every species of bird and in the rabbit. They mostly end the existence of the victim. They are commonly seen in coccidiosis and are probably toxic in origin, as are the epileptiform convulsions of suckling bitches. In reflex epilepsy, if the cause is removable the convulsions may cease, but there are some reflex causes—as parasites in the ear or on the skin—which may be removed, but at the least irritation or scratching of the skin, especially of the back or loin, the convulsions reappear. This is more so in the cat than in the dog. The best account of the various forms of epilepsy, epileptiform convulsions, status epilepticus, status convulsivus, is that of the Anglo-French neurologist the late Dr. Brown-Sequard. Although written for medical men, it accords with veterinary experience, at least so far as my observations or experience go. Veterinary textbooks are in general not very lucid on these conditions, which are by no means rare in the dog and cat. Brown-Sequard was not only a physician but also a physiologist and one of the pioneers, if not the pioneer, of endocrinology. Schiff (1859-1884) was also a great pioneer on the thyroid function and its connection with various disturbances of the nervous system. Apparently we are only using new names for old things. The physiology of nutrition and its application in practice seem to have been better understood fifty or even a hundred years ago than to-day. But in those days they did not use such mystifying language. If vitamins were not understood as such, they were used much more in the dietary of the man or of the animal. Fashion is a hysteria; it destroys the reason and ignores the past.

Yours faithfully,

HENRY GRAY.

Tetanus in Animals.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—The articles appearing recently in the *Record* on this subject are varied in their reference to symptoms, causes and treatment in the different animals affected. Tetanus appears to me to be a disease that runs in cycles, and is equally common in the horse, cow, sheep and pig. This last Spring has been one in which the disease was prevalent. Within two months I met with cases in three horses, three cattle and four pigs, the death roll being two horses and all four pigs. In my experience pigs rarely recover; they appear to die from choking about the third or fourth day. An obstruction of the breathing in either the nose or throat is generally the first symptom noticed and the "haw" of the eye is prominent, while all the muscles of the fore end of the pig are rigid. Some clients object to the use of an antiseptic after castration because they say that it often causes the pig to scrape the newly-cut surface along the ground and so fill the wounds with filth. There is some truth in this unless the antiseptic used is a very mild one and non-irritating.

With cattle I have better luck. Of the three cases mentioned two were in bullocks about a year old, a few days castrated, and one in a Friesian milk cow, the cause being unknown.

Of the three horses one was a two-year-old Shire colt with a wound on the hind leg—he died about the tenth day one a mare four weeks off foaling: cause of disease unknown—she has since foaled all right and is now rearing her foal; the third was a three-weeks-old foal: cause unknown: he died within three days. The disease is not uncommon in foals about this age and I always strongly suspect the navel as the port of entrance.

Treatment.—I have lost all faith in anti-tetanic serum for many years. I have used different antitoxins in large and in ordinary doses, and I can never see the slightest benefit from its use. One Spring a wealthy owner lost three long-priced horses from tetanus, and all the anti-toxin treatment known was used. In my opinion the old idea of putting in a dark box, with absolute quiet and the administration of sedatives, is the straight road to killing them. With slings I have never had any luck. Of course, so many clients have heard of the anti-tetanic treatment that one still has to use the hypodermic syringe to satisfy them, but if left to myself, I turn them out winter or summer into a hilly field for preference, and get as much mag. sulph. into their system as I can. Constant exercise appears to relieve and to lessen the rigidity of the muscles. Horses taking tetanus in the field, if left there never show such acute symptoms and rarely die. If the weather is hot and the flies keen the recovery seems even to be more rapid. I have turned horses, when first seen by me, out in the field when they have appeared as blocks of wood, quite unable to get their noses within a foot or more of the floor and before night by constant trying they can reach the grass and start to suck at it. I have known farm horses worked for days with tetanus. Recently a lad told me the reason that he fetched me was that he could not get the horse turned at the ends of the furrows, and the other horse could not pull him round in the plough. That was a case of acute tetanus, but he recovered although it took him six weeks before the stiffness completely disappeared.

I am quite aware that there are an acute and a subacute form of tetanus, but my argument is that steady, regular exercise prevents the acute form developing in a large majority of cases. A horse down in a box with tetanus is hopeless—not so the horse down in the field. I have repeatedly had to raise them in the field and then they have recovered. One client discovered that by scotching the horses feet and putting two planks underneath him he could lever him up, much the same as putting a heavy table on to its legs. I forbid all drenching and unless a horse can drink or suck his medicine he goes without.—Yours faithfully, WM. A. CAMPBELL.

Boroughbridge, Yorks.

July 30th, 1927.

B. abortus and Man.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—*Re* your "Notanda," page 678, of Vol. vii, dated July 30th, 1927, concerning the infection of human beings with *B. abortus* (*Veterinary Medicine*) I wish to report that early in 1926, while mixing up a live emulsion of three different strains of *B. abortus* (one of the three was freshly isolated from an aborted fœtus and the other two were from the Lister Institute) with a pipette to have a well-mixed emulsion with which to hyperimmunise rabbits for immune sera, I swallowed over 1 c.c. by mistake, without any apparent change or illness. My temperature was taken daily for five days without any rise whatever; my alimentary canal and appetite kept normal. The only obvious inconvenience was a slight pharyngitis which disappeared within the third day without any treatment.—Yours faithfully, ZAKI MORCOS, M.V.Sc., F.R.C.V.S., D.V.H.

City and University Bact. Labs.,
Liverpool.

The Editor acknowledges the receipt of the following:—

Communications from Mr. R. L. Higgins and the Secretary of the Animal Diseases Research Association of Scotland.